

IN THE CLAIMS:

Please cancel Claims 1 to 7, 17 to 23 and 33 without prejudice or disclaimer of subject matter.

Please amend Claims 8, 13 to 15, 24, 29 to 31 and 34 as follows. The claims, as pending in the subject application, read as follows:

1. to 7. (Canceled)

Q1
8. (Currently Amended) An image encoding apparatus for performing intra-frame encoding of image signals of a plurality of frames, comprising:
input means for inputting an image signal including pixel values of a frame;
transformation means for applying a discrete wavelet transform to an the image signal of each frame and outputting transformed coefficients of each frame;
motion detection means for detecting motion of an image based upon the image signals of plural frames;
region designation means for designating a region of the image signal of the frame based upon information indicating motion of the image detected by said motion detection means;
quantization means for quantizing the transformed coefficients of each frame a discrete wavelet transformed output from said transformation means in accordance with so as to differentiate an image quality of an image of the region designated by said region designation means from an image of other regions, and outputting a quantized image signal; and

encoding means for encoding the quantized image signal quantized by said quantization means,

wherein, upon encoding of each frame, the transformed coefficients of each frame are independent of pixel values of other frames.

9. (Original) The apparatus according to claim 8, wherein said motion detection means detects motion of the image in accordance with a difference between pixel values of two mutually adjacent pixels vertically of the image signal.

10. (Original) The apparatus according to claim 8, wherein said motion detection means detects motion of the image in accordance with a difference between pixel values of corresponding pixels in two successive frames of the image signal.

11. (Original) The apparatus according to claim 8, wherein said motion detection means includes:

block calculation means for forming the image signal into blocks and calculating motion vectors on a block-by-block basis; and

detection means for detecting motion of the image based upon whether magnitude of a motion vector calculated by said block calculation means is greater than a predetermined value.

12. (Original) The apparatus according to claim 8, wherein said quantization means performs quantization upon raising quantization precision of the image region designated by said region designation means.

13. (Currently Amended) The apparatus according to claim 8, wherein said region designation means designates a region of the image ~~signal~~ based upon the information indicating motion of the image output by said motion detection means.

14. (Currently Amended) The apparatus according to claim 8, wherein said region designation means designates a region of the image ~~signal~~ not contained in the information indicating motion of the image output by said motion detection means.

Q. 15. (Currently Amended) An image encoding apparatus for encoding image signals of a plurality of frames, comprising:

input means for inputting an image signal including pixel values of a frame;

transformation means for applying a discrete wavelet transform to the image signal of each frame and outputting transformed coefficients for each frame;

motion detection means for detecting motion of an image based upon the image signals of plural frames;

counting means for counting a number of pixels based upon information indicating motion of the image detected by said motion detection means;

selection means for selecting a method of designating an area of the image based upon information indicating motion of the image detected by said motion detection means, the selection being based upon the number of pixels counted by said counting means, and for designating a region of the image of the frame based upon the information;

quantization means for quantizing the transformed coefficients of each frame so as to differentiate an image quality of the image of the designated region from an image of other regions, and outputting a quantized image signal; and

encoding means for encoding the quantized image signal quantized by said quantization means

The apparatus according to claim 8, wherein said region designation means includes:

~~counting means for counting number of pixels based upon the information indicating motion of the image detected by said motion detection means; and selection means for selecting a method of designating an area of the image signal that is based upon the information indicating motion of the image detected by said motion detection means; based upon the number of pixels counted by said counting means.~~

Q. 16. (Original) The apparatus according to claim 8, wherein said encoding means decomposes a data sequence, which is supplied from said quantization means, into bit planes, applies binary arithmetic encoding on a per-bit-plane basis and outputs code sequences giving priority to code sequences that correspond to bit planes of higher order bits.

17. to 23. (Canceled)

24. (Currently Amended) An image encoding method for intra-frame encoding an image signals of a plurality of frames, comprising:

an input step of inputting an image signal including pixel values of a frame;

a transformation step of applying a discrete wavelet transform to the image signal of each frame and outputting transformed coefficients of each frame;

a motion detection step of detecting motion of an image based upon the image signals of plural frames;

a region designation step of designating a region of the image ~~signal of the~~ frame based upon information indicating motion of the image detected at said motion detection step;

a quantization step of quantizing the transformed coefficients of each frame ~~a transformed image signal output from said transformation step in accordance with~~ so as to differentiate an image quality of an image of the region designated at said region designation step from an image of other regions, and outputting a quantized image signal; and

an encoding step of encoding the quantized image signal quantized at said quantization step,

wherein, upon encoding of each frame, the transformed coefficients of each frame are independent of pixel values of other frames.

25. (Original) The method according to claim 24, wherein said motion detection step detects motion of the image in accordance with a difference between pixel values of two mutually adjacent pixels vertically of the image signal.

26. (Original) The method according to claim 24, wherein said motion detection step detects motion of the image in accordance with a difference between pixel values of corresponding pixels in two successive frames of the image signal.

27. (Original) The method according to claim 24, wherein said motion detection step includes:

a block calculation step of forming the image signal into blocks and calculating motion vectors on a block-by-block basis; and

a detection step of detecting motion of the image based upon whether magnitude of a motion vector calculated at said block calculation step is greater than a predetermined value.

28. (Original) The method according to claim 24, wherein said quantization step performs quantization upon raising quantization precision of the image region designated at said region designation step.

Q, 29. (Currently Amended) The method according to claim 24, wherein said region designation step designates a region of the image ~~signal~~ based upon the information indicating motion of the image output at said motion detection step.

30. (Currently Amended) The method according to claim 24, wherein said region designation step designates a region of the image ~~signal~~ not contained in the information indicating motion of the image output at said motion detection step.

31. (Currently Amended) An image encoding method for intra-frame encoding image signals of a plurality of frames, comprising:

an input step of inputting an image signal including pixel values of a frame;

a transformation step of applying a discrete wavelet transform to the image signal of each frame and outputting transformed coefficients of the each frame;

a motion detection step of detecting motion of an image based upon the image signals of plural frames;

a counting step of counting a number of pixels based upon information indicating motion of the image detected in said motion detection step;

a selection step of selecting a method of designating an area of the image based upon the information indicating motion of the image detected in said motion detection step, the selection being based upon the number of pixels counted in said counting step, and for designating a region of the image of the frame based upon the information;

a quantization step of quantizing the transformed coefficients of each frame so as to differentiate an image quality of an image of the designated region from an image of other region, and outputting a quantized image signal; and

and encoding step of encoding the quantized image signal quantized in said quantization step

The method according to claim 24, wherein said region designation step includes:-

~~a counting step of counting number of pixels based upon the information indicating motion of the image detected at said motion detection step; and~~

~~a selection step of selecting a method of designating an area of the image signal that is based upon the information indicating motion of the image detected at said motion detection step, based upon the number of pixels counted at said counting step.~~

32. (Original) The method according to claim 24, wherein said encoding step decomposes a data sequence, which is supplied by said quantization step, into bit planes, applies binary arithmetic encoding on a per-bit-plane basis and outputs code sequences giving priority to code sequences that correspond to bit planes of higher order bits.

33. (Canceled)

34. (Currently Amended) A computer-readable storage medium storing a program for implementing an image encoding method for intra-frame encoding ~~an input~~ image signals of a plurality of frames, the program comprising the steps of:

inputting an image signal including pixel values of a frame;

~~a module of~~ a transformation step of applying a discrete wavelet transform to the image signal of each frame and outputting transformed coefficients of each frame;

~~a module of~~ a motion detection step of detecting motion of an image based upon the image signals of plural frames;

~~a module of~~ a region designation step of designating a region of the image signal of the frame based upon information indicating motion of the image detected by the ~~module of said~~ motion detection step;

~~a module of~~ a quantization step of quantizing ~~a transformed output by the module of said transformation step in accordance with~~ the transformed coefficients of each frame so as to differentiate an image quality of an image of the region designated by the ~~module said~~ region designation step from an image of other regions, and outputting a quantized image signal; and

~~a module of~~ an encoding step of encoding the quantized image signal
quantized by the ~~module of said~~ quantization step,

wherein, upon encoding of each frame, the transformed coefficients of each
frame are independent of pixel values of other frames.